

Further new taxa in *Banksia* (Proteaceae: Grevilleoideae)

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Abstract

George, A.S. Further new taxa in *Banksia* (Proteaceae: Grevilleoideae). *Nuytsia* 18(1): 53–59 (2008). Three new taxa are described: *Banksia ashbyi* Baker f. subsp. *boreoscaia* A.S.George, *B. incana* A.S.George var. *brachyphylla* A.S.George and *B. sphaerocarpa* R.Br. var. *pumilio* A.S.George. The taxon described as *B. sphaerocarpa* var. *latifolia* F.Muell. ex Benth. (1870) and later placed in synonymy under var. *sphaerocarpa* has recently been rediscovered and is again recognised as an accepted taxon.

Introduction

In preparation for a new book on *Banksia* L.f., three new taxa are described. They have been known for many years and included within the range of variation in named taxa but are now, following further research, deemed worthy of formal recognition. Also, an early name is resurrected for collections previously included within the variation of *Banksia sphaerocarpa* R.Br. var. *sphaerocarpa*. Significant variation remains in several taxa but very detailed work is required (beyond the scope of this study) to determine whether distinct taxa can be recognised within them. They include, in particular, *B. marginata* Cav. which has arborescent and shrubby forms, fire-tolerant and fire-sensitive forms, as well as variation in leaf and follicle morphology. Several other species have populations of both arborescent and shrubby form: notably *B. aemula* R.Br., *B. attenuata* R.Br., *B. grandis* Willd., *B. ilicifolia* R.Br., *B. integrifolia* L.f., *B. littoralis* R.Br. and *B. menziesii* R.Br., but there are intermediate forms, and the species' response to fire is constant. Yet others (notably *B. media* R.Br., *B. occidentalis* R.Br.) have shrubby inland forms with low-growing coastal forms that sometimes retain their low habit in cultivation. In the case of *B. saxicola* A.S.George, a low habit on the exposed summits of The Grampians grades to tall shrubs in sheltered valleys, and on Wilson's Promontory it is a tree; again, their fire-response is constant, and there appear to be no morphological characters by which formal taxa might be distinguished.

Banksia ashbyi Baker f., *J. Bot.* 72: 281 (1934). *Type*: near Yuna, Western Australia, c. 1930, E. Ashby, *Herb. A. Morris* 2537 (*lecto*: BM; *isolecto*: AD).

Banksia ashbyi Baker f. subsp. ***ashbyi***

Shrub or tree to 7 m, without lignotuber, fire-sensitive. Leaves commonly deep green.

Selected specimens examined. WESTERNAUSTRALIA: Kennedy Range, 11 Aug. 1981, *R.J. Cranfield* 1918 (PERTH); E of Yuna, 14 May 1961, *A.S. George* 2394 (PERTH); c. 60 km S of Billabong Roadhouse, North West Coastal Hwy, 30 Sep. 1985, *N. Hoyle* 673 (CANB, PERTH); between Tamala and Nilemah Station, 20 July 1988, *P. Morat* 8254 (P, PERTH).

Distribution. Western Australia, between Shark Bay and Coorow, and in the Kennedy Range.

Habitat. In deep sand with tall shrubland

Flowering period. Any month but mainly winter.

Conservation status. Not rare or endangered.

Banksia ashbyi* subsp. *boreoscaia A.S.George, *subsp. nov.*

Frutex ad 2 m alta, lignotubero. Folia semper griseo-viridia.

Typus: Quobba Point, north of Carnarvon, Western Australia, 24° 29' S, 113° 25' E, 15 October 1975, *K.F. Kenneally* 4704 (*holo:* PERTH 01722433; *iso:* CANB, K).

Sprawling *shrub* to 2 m, with lignotuber. *Leaves* consistently grey-green.

Selected specimens examined. WESTERN AUSTRALIA: SE of 5 Mile Well, Cape Range, 26 May 1965, *Y. Chadwick* 2287 (PERTH); Day Centre, Yardie Creek, 16 May 2006, *J. English* 13 (PERTH); c. 1.5 km E of [Vlaming Head] lighthouse, North West Cape, 31 Dec. 1960, *A.S. George* 2299 (CANB, PERTH); 15 km N of Ningaloo Homestead on road to Yardie Ck, 30 July 1980, *K.F. Kenneally* 7360 (PERTH).

Distribution. Western Australia, between North West Cape and Quobba.

Habitat. Coastal dunes and on some red dunes of the Cape Range, growing in low shrubland.

Flowering period. Any season but mainly winter.

Conservation status. Not rare or endangered.

Etymology. From the Greek *borealis* (northern) and *skaios* (west, left-hand), in reference to the occurrence in the north-west of Western Australia. It is the only taxon of the genus in this region.

Discussion. Although there is no morphological feature in foliage, flowers or fruit to distinguish the populations north of Carnarvon from those south of Shark Bay, the consistent difference in habit (fire-tolerant contrasted with fire-sensitive) gives them a distinctive appearance that is retained in cultivation. This differs from the situation in other species with tall and short variants (e.g. *B. media*, *B. seminuda* (A.S.George) Rye, *B. serrata* L.f.) in which the fire response is consistent.

Banksia incana A.S.George, *Nuytsia* 3: 441 (1981). *Type*: 'Outside Mogumber Mission', Western Australia, c. 31° 00' S, 115° 56' E, 2 February 1967, *A.S. George* 8644 (*holo*: PERTH 01580523; *iso*: AD, BRI, CANB, K, MEL, NSW, PERTH 01580531, RSA).

Banksia incana A.S.George var. ***incana***

Typically a rather open *shrub*. *Leaves* usually 30–50 mm long, sometimes to 60 mm.

Selected specimens examined. WESTERN AUSTRALIA: Cadda Rd near NW corner Badgingarra National Park, 26 Mar. 1977, *A.S. George* 14411 (PERTH); Sultana Rd, Forrestfield, 16 Nov. 1992, *G.J. Keighery* 12749 (PERTH); Hi Vallee, 10 July 1999, *M. Hislop* 1370 (PERTH); near Eneabba, 15 Nov. 1996, *A.R. Mast* 357 & *D.S. Feller* (PERTH, WIS).

Distribution. Western Australia, between Arrowsmith and Mogumber, with disjunct populations near Gingin and Perth.

Habitat. In deep sand and sand over laterite, in kwongan and low open woodland.

Flowering period. Autumn and winter.

Conservation status. Not rare or endangered.

Banksia incana var. ***brachyphylla*** A.S.George, *var. nov.*

Ab *Banksia incana* A.S.George var. *incana* foliis brevioribus (plerumque 10–20 mm longis) differt.

Typus: Big Soak Plain, Coorow–Green Head Road, Western Australia, 30° 05' S, 115° 37' E, *M.A. Langley* 2207 & *L.W. Sage*, 23 November 1999 (*holo*: PERTH 06393470).

Typically a mounded *shrub*. *Leaves* usually 10–20 mm long, commonly shorter, occasionally to 25 mm.

Selected specimens examined. WESTERN AUSTRALIA: near Badgingarra, Apr. 1963, *R. Aitken s.n.* (PERTH); Coomallo Ck, 15 Dec. 1976, *R.J. Hnatiuk* 761395 (PERTH); E boundary of Badgingarra National Park, 9 km SW of Badgingarra, 27 Mar. 1984, *S.D. Hopper* 3602 (PERTH); opposite Marchagee Track turnoff, Brand Hwy, 1 Dec. 1977, *B. Jack s.n.* (PERTH).

Distribution. Western Australia, from Badgingarra National Park to Alexander Morrison National Park and Big Soak Plain (SW of Coorow).

Habitat. In deep sand, shallow sand over laterite or lateritic gravel, in kwongan.

Flowering period. Early summer to early winter.

Conservation status. Not rare or endangered.

Etymology. From the Greek *brachys* (short) and *phyllum* (a leaf), in reference to the leaves.

Discussion. Geographically the taxon occurs to the east of the northern distribution of typical *B. incana* but there is one record of var. *incana* farther north-east. The two varieties sometimes occur close together (within 10 km along Coorow–Green Head Road east of the Brand Highway) but have not been recorded growing sympatrically. They grow in similar habitats. Usually var. *brachyphylla* is a low, mounded shrub, in contrast to the more open, erect habit of typical *incana*. In its extreme form the leaves are all below 15 mm long, giving the plant a ‘heath-like’ aspect. It is variable in leaf width, from 1 mm to 2 mm wide. In several collections the leaves are intermediate in length between the two forms, e.g. *A. Strid* 21738, 18–20 km W of Mogumber (PERTH) which has leaves 15–35 mm long. In keeping with my concept of the ranks of subspecies and variety (George 1996: 314), it is more appropriate to recognise the taxa as varieties rather than subspecies.

Banksia sphaerocarpa R.Br., *Trans. Linn. Soc. London* 10: 203 (1810). *Type:* Just north of King George Sound, [Western Australia], December 1801, *R. Brown* (*lecto:* BM; *isolecto:* BM).

Banksia sphaerocarpa is one of the most varied and widely distributed western banksias. It occurs from the Eneabba district south to the Whicher Range and Albany and east to the Ironcaps (east of Lake King). In habit it is a lignotuberous shrub but ranges from a small, sprawling plant to a rounded plant up to 3 m tall and 4 m wide. There is variation in the size of leaf, flower and fruit. Some of this variety has already been captured in the formal recognition of three varieties, var. *sphaerocarpa*, var. *caesia* A.S.George and var. *dolichostyla* A.S.George. A varietal name published by George Bentham (based on a manuscript name of Ferdinand Mueller) – var. *latifolia* – was synonymised by George (1981) under var. *sphaerocarpa* pending its rediscovery and hence availability of more comprehensive material. The variant has been rediscovered recently and differs consistently from typical var. *sphaerocarpa* in the short, broad leaves and in having a low, dense, mounded habit. It is here restored as an accepted taxon. Of other variants in the species the populations that occur from the Chittering district northwards are also recognised here as a variety, having consistently shorter flowers than var. *sphaerocarpa*. Several recent collections from and near Jilbadgi Reserve east-south-east of Merredin (e.g. *M. Mikli* 1635, PERTH) have flowers in the lower end of the size range of var. *dolichostyla* but one is intermediate in size between var. *caesia* and var. *dolichostyla*. Further study of these populations is required, but they appear to confirm the close relationship between the varieties.

Key to varieties of *Banksia sphaerocarpa*

- 1. Perianth 49–55 mm long; pistil 50–65 mm long.....var. **dolichostyla**
- 1: Perianth 20–39 mm long; pistil 22–46 mm long
- 2. Leaves 2–2.5 mm wide, obtuse with blunt mucro..... var. **latifolia**
- 2: Leaves 1–1.5 mm wide, acute with pungent mucro
- 3. Perianth 20–25 mm long; pistil 22–31 mm long..... var. **pumilio**
- 3: Perianth 30–39 mm long; pistil 35–46 mm long
- 4. Follicles commonly 15–30 mm long; leaves usually mid to deep green; perianth usually brown var. **sphaerocarpa**
- 4: Follicles commonly 8–17 mm long; leaves usually blue-green; perianth usually golden var. **caesia**

Banksia sphaerocarpa* R.Br. var. *sphaerocarpa

Typically a *shrub* 1–2 m tall. *Leaves* linear, acute, 2.5–10 cm long, *c.* 1.5 mm wide. *Perianth* 30–39 mm long. *Pistil* 35–46 mm long. *Follicles* 15–30 mm long, 10–25 mm wide.

Selected specimens examined. WESTERN AUSTRALIA: 1.5 km along Chillinup Rd from [Albany–] Chester Pass Rd, 18 Feb. 1998, *L.W. Cayzer* 551, *G.T. Chandler* & *S. Donaldson* (CANB, NSW, PERTH); Yeriminup Rd, west of Cranbrook, 17 Feb. 1997, *R. Davis* 2549 (PERTH); Old Yornup Rd, off Seaton Ross Rd, Yornup, 4 June 2002, *D. Foster* 66 (PERTH); 6–7 km W of Cape Riche, 29 Mar. 1964, *A.S. George* 6160 (PERTH); track to summit, Mt Lindesay, 3 Feb. 1980, *J.M. Powell* 1438 (NSW, PERTH); *c.* 25 km E of Collie, 20 July 1967, *E.M. Scrymgeour* 2065 (PERTH).

Distribution. Western Australia, from the Darling Plateau east of Perth south to the Whicher Range and east to the Stirling Range and Cape Riche.

Habitat. Grows in laterite or sandy loam over laterite, in forest or woodland of *Eucalyptus marginata*, mallee open shrubland and kwongan.

Flowering period. Mostly autumn and winter.

Conservation status. Not endangered but several variants appear rare.

Discussion. As mentioned in George (1981, 1999), this taxon shows much variation. Noteworthy variants include one from the Whicher Range with large follicles that have a quite acute ridge while closed. Several collections from the Jarrah forest also have large follicles. One from near Nannup (*A.S. George* 17516, PERTH) has short, broad leaves but is a small, sprawling plant (unlike var. *latifolia*, see below); it has large, sharp-edged follicles like the Whicher Range variant. There is a similar collection but without fruit from south-south-east of Rocky Gully, *A.R. Annels* 3692 (PERTH).

Banksia sphaerocarpa* R.Br. var. *pumilio* A.S.George, var. *nov.

Ab varietibus aliis *Banksiae sphaerocarphae* habitu plerumque minori, floribus brevioribus et folliculis plerumque majoribus differt. Frutex minus quam 1 m altus. Perianthium 20–25 mm longum. Pistillum 22–31 mm longum. Folliculi 20–30 mm longi, 15–25 mm lati.

Typus: *c.* 6 km north of Badgingarra, Western Australia, *c.* 30° 22' S, 115° 33' E, 11 April 1964, *A.S. George* 6185 (*holo:* PERTH 01757903; *iso:* PERTH 01757881).

Typically a *shrub* less than 1 m tall. *Perianth* 20–25 mm long. *Pistil* 22–31 mm long. *Follicles* 20–30 mm long, 15–25 mm wide.

Selected specimens examined. WESTERN AUSTRALIA: Mogumber Mission [i.e. *c.* 10 km W of Mogumber], 12 Apr. 1964, *A.S. George* 6200 (PERTH); 67 mile peg, Great Northern Hwy [i.e. Udumung Brook Nature Reserve, N of Bindoon], 10 June 1966, *A.S. George* 7767 (PERTH); Tathra National Park, 27 Mar. 1977, *A.S. George* 14423 (PERTH); Hi Vallee farm [N of Badgingarra], 30 Apr. 2000, *M. Hislop* 1989 (PERTH); S of Mimegarra Rd [turnoff] on Brand Hwy, 10 July 1988, *B.J. Keighery* 127B (PERTH); Big Soak Plain, Warradarge, 21 Sept. 2005, *K. Pearce* 15 (PERTH).

Distribution. Western Australia, from Tathra National Park east of Eneabba south to the Chittering valley.

Habitat. Shallow sand or clay-loam over laterite, in kwongan (sometimes with emergent mallee eucalypts) and low open forest of *Eucalyptus marginata* and *E. calophylla*, usually on mid to upper slopes in landscape

Flowering period. Mostly late autumn to mid winter.

Conservation status. Not rare or endangered.

Etymology. From the Latin *pumilio* (small), in reference to the flowers.

Discussion. Typically this has leaves 2–4 cm long but occasionally 5–6 cm, e.g. Mullering Road near Dandaragan, *E.R. Minty* 12 (PERTH); c. 15 km N of Moora, *B. Morgan* 148 (PERTH). In follicle size this sometimes approaches *B. micrantha* A.S.George. The follicles are flattened (while retaining the transverse ‘shoulders’ that characterise *B. sphaerocarpa*), in contrast to the large-follicle variant of var. *sphaerocarpa* from the Whicher Range.

Banksia sphaerocarpa* var. *latifolia F.Muell. ex Benth., *Fl. Austral.* 5: 546 (1870).

Type: Porongurup Range, Western Australia, *s. dat.*, *G. Maxwell* (*lecto:* MEL; *iso:* MEL; probable *isolecto:* PERTH 01757725).

Typification. The specimen at PERTH considered a probable isoelectotype is on a sheet ex MEL that bears three collections, all attributed to James Drummond with the number 1: 648. Two specimens in leaf (PERTH 01757733) are *B. telmatiaea* A.S.George and are probably this number since duplicates are in other herbaria such as P. Another specimen in late bud (PERTH 01757717) is *B. incana*, probably *Drummond* 337 as it agrees with specimens under this number at K. The third specimen (PERTH 01757725) is in mid-bud and has short, broad leaves (10–30 mm long, 2–2.7 mm wide); it agrees with the Maxwell collection at MEL on which var. *latifolia* is based.

Shrub to 50 cm tall, much-branched and dome-like. *Leaves* 11–38 mm long, 2–2.7 mm wide, rounded at apex with a very short obtuse mucro. *Perianth* 33–37 mm long, very hirsute. *Pistil* 41–45 mm long. *Follicles* 15–22 mm long, 12–15 mm wide.

Specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] May 2006, *K. Collins* (PERTH); May 2007, *K. Collins* (PERTH).

Distribution. Western Australia, Mt Barker district.

Habitat. In granitic clay-loam in low, open forest of *Eucalyptus marginata* and *E. calophylla*, usually on mid to upper slopes in landscape

Flowering period. Mostly late autumn to mid winter.

Conservation status. Recently listed as Priority Two under Department of Environment and Conservation (DEC) Conservation Codes for Western Australian Flora. Known from few populations and one contains several hundred plants.

Discussion. This variant has recently been rediscovered and cultivated by Kevin Collins at The Banksia Farm, Mt Barker, Western Australia. Besides the short, broad leaves it has a very compact, dome-like habit and is sufficiently distinct to warrant recognition as a valid taxon. It is known only from the Mount Barker area. Four collections at PERTH from the same region also have short leaves but these are very narrow like typical var. *sphaerocarpa*: King George Sound, 1901, *B.T. Goadby*; Boulder Hill, Betty Beach, *G.J. Keighery* 8248; Denbarker, 'Survey Team 1608'; and Mt Lindesay, *J.M. Powell* 1438. The last two of these were noted as shrubs to 60 cm tall.

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References

- George, A.S. (1981). The genus *Banksia* L.f. (Proteaceae). *Nuytsia* 3(3): 239–474.
- George A.S. (1996). New taxa and a new infrageneric classification in *Dryandra* (Proteaceae: Grevilleoideae). *Nuytsia* 10(3): 313–408.
- George, A.S. (1999). *Banksia*. In: *Flora of Australia*. Vol.17B, pp. 175–251, 320–323, 376–382, 396. (Australian Biological Resources Study: Canberra.)